

## **Portland Harbor Site Remedial Action Objectives<sup>i</sup>**

### **RAO 1:**

**Reduce to acceptable levels human health risks from exposure to contaminated sediments<sup>ii</sup> and groundwater resulting from incidental ingestion of and dermal contact with sediments and groundwater and comply with identified ARARs.**

This RAO applies to direct human health sediment exposure scenarios found to have an unacceptable risk in the risk assessment and human health risks from ingesting groundwater that exceeds ARARs with the understanding that groundwater plumes exceeding ARARs will be controlled through upland source control actions. The goal for this RAO is to reduce risks to human health from COC concentrations in contaminated sediments and groundwater through sediment remedies at the site, comply with chemical-specific ARARs identified for the site, and protect beneficial uses of the Willamette River at the site.

### **RAO 2:**

**Reduce to acceptable levels human health risks from indirect exposures to COCs through ingestion of fish and shellfish that occur via bioaccumulation pathways from sediment, groundwater and/or surface water and comply with identified ARARs.**

This RAO applies to fish and shellfish consumption scenarios found to have an unacceptable risk in the risk assessment with the understanding that groundwater plumes will be controlled to achieve ARARs and risk-based remediation goals through upland source control actions. The goal is to reduce risks to human health through sediment remedies that protect humans from indirect exposures to COCs through eating fish and shellfish exposed to COCs via bioaccumulation and bioconcentration, comply with chemical-specific ARARs identified for the site, and protect the beneficial uses of the Willamette River at the site. This RAO is expected to contribute to the reduction and elimination of Portland Harbor PCB fish consumption advisories. It is recognized that reduction and elimination of the Portland Harbor fish advisory can only be achieved when conducted in conjunction with other Portland Harbor source controls and other PCB reduction efforts conducted under other regulations and programs within the Willamette River watershed, as described in the Source Control Management Goal below.

### **RAO 3:**

**Reduce risks from COCs in surface water at the site to acceptable exposure levels that are protective of human health risks from ingestion of, inhalation of, and dermal contact with surface water, protect the drinking water beneficial use of the Willamette River at the site, and comply with identified ARARs.**

This RAO applies to direct human health surface water exposure scenarios found to have an unacceptable risk in the risk assessment and the protection of the drinking water beneficial use of the Willamette River. The goal is to reduce risks from COC concentrations in surface water, to the extent practicable, through sediment remedies that protect humans from the ingestion of and dermal contact with surface water; comply with chemical specific ARARs identified for the site; and protect the beneficial uses (domestic/private water supply) of the Willamette River at the site.

#### **RAO 4:**

**Reduce to acceptable levels the risks to ecological receptors resulting from the ingestion of and direct contact with contaminated sediments and groundwater and comply with identified ARARs.**

This RAO applies to all ecological receptors found to have an unacceptable risk in the risk assessment and through exceedances of ARARs via direct sediment exposure with the understanding that groundwater plumes will be controlled to achieve ARARs and risk-based remediation goals through upland source control actions. The goal is to reduce risks to ecological receptors from COC concentrations in contaminated sediments and groundwater through sediment remedies at the site, prevent unacceptable effects on the survival, growth, and reproduction of ecological receptors at the site, and comply with chemical-specific ARARs identified for the site. ▯

#### **RAO 5:**

**Reduce to acceptable levels risks to ecological receptors from indirect exposures, through ingestion of prey, to COCs in sediments via bioaccumulation pathways from sediment, groundwater and/or surface water and comply with identified ARARs.**

This RAO applies to all ecological receptors found to have an unacceptable risk in the risk assessment through ingestion of prey with the understanding that groundwater plumes will be controlled to achieve ARARs and risk-based remediation goals through upland source control actions. The goal is to reduce risks from COCs through sediment remedies that protect ecological receptors from exposures to COCs through consumption of fish and shellfish, benthic organisms and other prey items exposed to COCs via bioaccumulation and bioconcentration; comply with chemical-specific ARARs identified for the site; and protect the beneficial uses of the Willamette River. This RAO is expected to contribute to reduction of prey ingestion related ecological risks through reduction in sediment chemical contributions to fish tissue. It is recognized that reduction of and elimination of these risks can only be achieved when conducted in conjunction with other Portland Harbor source controls efforts conducted under other regulations and programs within the Willamette River watershed, as described in the Source Control Management Goal below.

#### **RAO 6:**

**Reduce risks from COCs in surface water at the site to acceptable exposure levels that are protective of ecological receptors based on the ingestion of and direct contact with surface water and comply with identified ARARs.**

This RAO applies to all ecological receptors found to have an unacceptable risk in the risk assessment through exposure to surface water. The goal is to reduce the risk from COC concentrations in surface water to the extent practicable, through sediment remedies that prevent unacceptable effects on survival, growth, and reproduction of ecological receptors; comply with identified chemical-specific ARARs; and protect the beneficial uses of the Willamette River.

## **Portland Harbor Site-Wide Management Goals<sup>iii</sup>**

### **Management Goal 1:**

**Ensure sediment cleanup activities consider, complement, and are compatible with, upland and upstream source control efforts designed to prevent recontamination by COCs in groundwater, stormwater, soil erosion, upstream sources and overwater activities at the site and are consistent with the RAOs for the site; and allow in water remedies at the site to proceed in a timely manner.**

This management goal recognizes that a successful site remedy includes the implementation of effective in-water remedies and upland source control measures. The goal is to have a sediment cleanup that supports and is compatible with upland and upstream source controls that prevent sediment recontamination after cleanup. The goal too must consider sequencing and other approaches in conducting sediment remedies that will minimize downstream migration of contaminants and themselves recontaminate downstream response actions. Further, sediment remediation activities should not hinder upland source control actions and water quality programs being implemented by Oregon DEQ. Upland and upstream source identification and control is being regulated and directed by Oregon DEQ working with individual parties within and outside Portland Harbor. The goal of these source controls is to reduce risk, control migration of contamination in all pathways to the river, and prevent the unacceptable recontamination of cleaned up sediments. Upland source control activities need to be implemented in a timeframe and manner that reduces risk and minimizes the potential for recontamination by COCs in groundwater, stormwater, soil erosion, and over water activities at, and upstream from the site and are consistent with and facilitate the achievement of site cleanup goals and compliance with ARARs. The FS will include an evaluation of the potential for in-river risks and recontamination from ongoing upland and upstream sources as allowed by existing data and information. The FS will estimate, as existing information allows, the source reduction levels on a site-wide basis that would be expected to meet various potential sediment and water PRGs including the uncertainty of such estimates. The FS will not attempt to estimate the source reduction actually provided by various individual potential, planned, or implemented source controls at properties along the river or the watershed as a whole. With regards to riparian soils, there may be cost savings by integrating sediment remedies along the shoreline with upland source control efforts. Upland source control efforts will address riparian soils that are likely to have a direct effect through the erosion of bank material upon sediments and surface

water below the mean high water mark. Factors that will be considered to determine whether riparian soils are likely to have a direct effect on sediments include the characteristics of the river bank, the presence of contamination and the status of upland source control efforts.

## **Management Goal 2:**

**To the maximum extent practicable, minimize the long-term transport of COCs in the Willamette River from the site to the Columbia River and the Multnomah Channel.**

The goal is to prevent the migration of sediment COCs at levels that would potentially pose unacceptable risks to human health and ecological receptors downstream of the site. Sediment cleanup alternatives will be evaluated in the FS under the long term effectiveness criterion to clearly estimate, as existing information allows, whether unacceptable downstream transport would be minimized (or not) by each alternative. Minimization of downstream COC transport will be a clear sub-criterion presented in the FS under the more general long term effectiveness criterion.

## **Management Goal 3:**

**Clean up contaminated sediments in a manner that promotes habitat that will support a healthy aquatic ecosystem and the conservation and recovery of threatened and endangered species.**

The goal is to ensure that sediment cleanup alternatives selected for the site consider the benefits of re-establishing ecological habitats in those areas remediated to support a diverse ecosystem. Sediment remedial actions must comply with ARARs, including the Clean Water Act compensatory mitigation and Section 404(b)(1) analysis and the Endangered Species Act. Other potential ARARs may include the Marine Mammal Protection Act and/or Migratory Bird Treaty Act. The need for habitat mitigation in conjunction with the remedial action alternatives will be evaluated for each detailed sediment cleanup alternative in the FS under the long term effectiveness and compliance with ARARs criteria and cost estimate analysis. For each detailed alternative, the FS will evaluate reasonably anticipated future land use with respect to habitat, including potential restoration activities under the Natural Resource Damages Assessment process. The FS will also clearly describe the degree to which habitat mitigation needs to be included to meet substantive requirements of potential ARARs. To support this evaluation the LWG is seeking a programmatic approach to addressing ESA issues with NOAA (including a programmatic consultation) to help appropriately define the habitat impacts from remediation and types of desirable mitigation and other reasonable and prudent measures. ~~A programmatic approach would support a more comprehensive and integrated watershed evaluation to promote the conservation of species.~~ For each detailed alternative, the FS will clearly describe whether habitat mitigation needs to be included to meet the substantive requirements of potential ARARs. This does not include evaluation of any potential or needed habitat restoration activities under the NRDA provisions of CERCLA, the Clean Water Act, and the Oil Protection Act (OPA).

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<sup>i</sup> RAOs will be refined after the draft human health and ecological risk assessments are made available to EPA and DEQ. These RAOs will be used to evaluate remedial action alternatives in the Portland Harbor Feasibility Study

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and as the basis for the evaluation, design and implementation of upland source control actions being performed under Oregon Department of Environmental Quality oversight.

ii Sediments are defined as soils, sand, organic matter, or minerals that accumulate on the river bottom. For purposes of describing the RAOs, sediment also includes the interstitial water and transition zone water (TZW) that is influenced by groundwater and surface water and thus can also be contaminated by groundwater, surface water, or chemicals dissolving off of the sediments. Sediments extend up to the ordinary high water mark (13.3 feet NAVD88) along the banks (including beach sediments) within the Portland Harbor Superfund Site. Riparian soils are found along the river banks from the ordinary high water mark to the mean high water mark (20 feet NAVD88). High water mark datum is from Proposed Round 3 Scope of Work, Portland Harbor Superfund Site, February 17, 2006.

iii Site-Wide Management Goals are those goals that must be evaluated in the Portland Harbor Feasibility Study to ensure a successful remedy and will require integration with other regulatory mechanisms to implement. These regulatory mechanisms include, but are not limited to, State of Oregon Water Quality and Environmental Cleanup programs. Specific numeric PRGs and remediation goals are not expected to be developed for these management goals by the LWG for their part in developing the Portland Harbor FS for the in-water portion of the Site. They will be considered in the development of in-water remedial alternatives, assessing compliance with ARARs including section 404 of the Clean Water Act and the Endangered Species Act and as part of the evaluation of long term effectiveness and permanence, implementability, and compatibility with anticipated future uses. EPA expects that upland source control measures will be the primary actions for protecting beneficial uses of groundwater, including potential water supply use, and that such controls will be conducted to achieve RAOs established for the in river portion of the Portland Harbor Site.